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by using lime or magnesia, which are peculiarly fitted for the purpose, a light so intense as to be only surpassed by the noon-day summer sun, may be obtained. This lime light has been introduced for experiment into lighthouses, and has been particularly serviceable in the trigonometrical surveys of these kingdoms, in consequence of which it is generally known as the Drummond light, from the eminent philosopher whose recent melancholy loss every Irishman must deplore. The heat produced by the flame of hydrogen is thus most intense; substances which are inattacked by the strongest furnaces melt like wax in the jet of oxygen and hydrogen, and in the Drummond light the lime appears gradually to evaporate.

A mixture of hydrogen and oxygen, or of hydrogen and air, may be thus set fire to by a candle; and when previously mixed, a terrific explosion is produced. Persons should therefore be very cautious how they perform experiments with hydrogen, as even skilful chemists have occasionally suffered severely from accidents of this kind. When a young person makes hydrogen for the first time, he is naturally curious, and hastens to satisfy himself by seeing that it burns: he applies the candle before all the common air has been expelled from the apparatus, and the mixture inside being still explosive, the flame passes back, and the whole is shattered into pieces with the noise and violence of a bombshell. At the same time, therefore, that we would be happy if this article induced many of our young readers to satisfy themselves of the composition and decomposition of water by actual experiment, yet we trust they will do so prudently, and with the guidance of some older person who has previously seen how chemical apparatus are employed.

If a wide tube of glass be held over the jet of burning hydrogen gas, a very curious result is produced: a powerful musical sound is heard, which changes according as the jet is moved up and down in the tube. The nearer the jet is to the orifice, the graver, the higher up in the tube it is, the more acute, is the sound heard. The cause of this is, that the flame, which to the eye appears uniform and continuous, is in reality a number of very small explosions of mixed air and gas. These succeed one another so rapidly that the intervals of darkness which intervene are not perceived, and the quantity of gas which explodes is too small to produce any audible noise; but on bringing a tube, the air in which is capable of vibrating with the same quickness as the little explosions are produced, the air is thrown into vibrations which reach the ear, and produce the peculiar musical tone. With a selection of gas jets and tubes a variety of notes may be produced, so great that a musical instrument has been constructed by their means.

Hydrogen gas is the lightest substance in nature, and it is consequently used to fill balloons, by which men have been carried to a height in the air much exceeding that of the loftiest mountains. When balloons were first made use of, they were of the kind which are now termed fire-balloons: the bag of the balloon was open at the bottom, and in the car was a furnace, the chimney of which terminated at the aperture of the balloon. The hot air and gases generated by the burning of the fuel in the furnace ascending into the bag, expelled the heavier cold air, and a sufficient power of rising was thus obtained, by the difference between the weight of the heated and of the cold air, to enable the balloon to take up a very considerable weight. Hydrogen gas being, however, at least ten times as light as the hot air, was much more convenient, as it required only a much smaller balloon; and the unfortunate death of the most remarkable experimenter of the fire-balloon, Pilatre de Rozier, contributed also very much to show their great danger, and prevent their being used.

Although many persons had proposed from time to time to ascend by means of balloons filled with heated or rarified air, or with hydrogen gas, it was reserved for the brothers Montgolfier of Lyons to realize this bold and singular idea. These brothers had originally been destined to science, but on the death of an elder brother who had been an extensive paper maker at Lyons, they abandoned their former pursuits to continue the manufacture. They made large paper balloons, which, whether filled with hydrogen gas or heated air, ascended, and one brother ascended to a small height at Lyons. On introducing their invention to the notice of the public and the royal family at Paris, the greatest enthusiasm was excited, and personages of the highest rank accompanied the adventurous brothers in their aerial voyages. Pilatre de Rozier, then director of the king's museum, devoted himself completely to

the improvement of the new art of the navigation of the air; and after having ascended from Versailles frequently, and gained a considerably greater height than any of his predecessors, he resolved to cross the British Channel, and pass from France to England in a fire-balloon. He ascended from a village about half way between Calais and Boulogne, on September the 16th, 1784, with a gentleman of the town as a companion; and having attained a considerable height, was carried by the favourable wind over the sea in his proper course. The balloon however continuing to rise, got into a current of air in an opposite direction, and was brought again over the land; at this moment the spectators on shore were horrified to observe that the balloon, half lost in the clouds, was on fire, and after a moment the car was observed to fall. The remains of the car and of the unfortunate aeronauts, in whom scarcely a vestige of human form could be traced, were found in a field on the road to Abbeville; and a stone bearing the simple inscription of the fate of Pilatre de Rozier and his companion marks to the present day the place, close by the road-side, where the bodies were inhumed.

The substitution of hydrogen or of coal gas for the fire-balloon, has deprived aerial navigation of its greatest dangers. No good means of steering or tacking a balloon having been discovered, the art has not yet fulfilled the expectations that were at first formed of it: the balloon is at the mercy of the winds; and although the voyagers travel in ease and safety, and often with rail-road speed, yet as it cannot be foretold in what direction the balloon must go, voyages in the air have been as yet only an exciting and not very dangerous amusement.

K.

THE THEATRE.—I approach a subject, on which a great variety of opinion exists, and that is the theatre. In its present state the theatre deserves no encouragement. It is an accumulation of immoral influences. It has nourished intemperance and all vice. In saying this, I do not say that the amusement is radically, essentially evil. I can conceive of a theatre which would be the noblest of all amusements, and would take a high rank among the means of refining the taste and elevating the character of a people. The deep woes, the mighty and terrible passions, and the sublime emotions of genuine tragedy, are fitted to thrill us with human sympathies, with profound interest in our nature, with a consciousness of what man can do, and dare, and suffer, with an awed feeling of the fearful mysteries of life. The soul of the spectator is stirred from its depths, and the lethargy in which so many live is roused, at least for a time, to some intenseness of thought and sensibility. The drama answers a high purpose when it places us in the presence of the most solemn and striking events of human history, and lays bare to us the human heart in its most powerful, appalling, glorious workings. But how little does the theatre accomplish its end! How often is it disgraced by monstrous distortions of human nature, and still more disgraced by profaneness, coarseness, indecency, low wit, such as no woman, worthy of the name, can hear without a blush, and no man can take pleasure in without self-degradation!—*Dr Channing on Temperance.*

CONSECRATED IRISH BELLS.—Consecrated bells were formerly held in great reverence in Ireland, particularly before the tenth century. Cumbrensis, in his Welsh Itinerary, says, "Both the laity and clergy in Ireland, Scotland, and Wales, held in such great veneration portable bells, and staves crook't at the top, and covered with gold, silver, and brass, and similar relics of the saints, that they were much more afraid of swearing falsely by them than by the gospels, because from some hidden and miraculous power with which they were gifted, and the vengeance of the saint, to whom they were particularly pleasing, their despisers and transgressors are severely punished." Miraculous portable bells were very common; Giraldus speaks of the *Campana fugitiva* of O'Toole, chieftain of Wicklow; and Colgan relates, that whenever St Patrick's portable bell tolled, as a preservative against evil spirits and magicians, it was heard from the Giants' Causeway to Cape Clear, from the Hill of Howth to the Western shores of Connemara.—*Hardiman's Irish Minstrelsy.*

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